IN THE CLAIMS

Claim 1 **(currently amended)**. High-performance thermal control duct comprised of two **planar** sheets or layers which are laid opposite, one on top of the other and which each have one-sided **grooved** depressions introduced in their parting or contact plane, wherein the height of the individual high performance thermal control duct is no greater than the thickness of the sheets used and the individual depressions are worked into the sheet in a material-removing and/or material-displacing manner and form sharp edges towards the sheet-parting plane and the sheet thickness in the region of the depression is reduced locally up to 90% and depressions having an identical depression area and an identical depression volume lie next to one another in the sheet-parting plane and have no connection to one another, and a plurality of depressions lying next to one another form a depression row or depression chain,

the geometric area of each depression has a greater extent in relation to the sheet width than in relation to the sheet length,

the larger longitudinal axis of each depression is at an angle α of 5 to 85 degrees to the mid-axis of the depression row or depression chain, one sheet being rotated by 180° with respect to the other sheet with the result that at least three depressions which are at an identical angle partially overlap and/or intersect one another and form a throughflow duct, the flow cross section of which is in the region where the two sheets face each other and at least one holed sheet as a turbulence exciter is inserted between said two sheets and the throughflow duct is stable under pressure.

Claim 2 (original). High-performance thermal control ducts according to Claim 1, further comprising an associated delivery inlet and discharge outlet, having flow cross section which are greater than the flow cross section of the high-performance thermal control duct.

Claim 3 (original). High-performance thermal control duct according to Claim 1, wherein the geometric area of the depressions decrease with an increasing distance from the surface of the sheet in which they are formed and form within the sheet, parallel to the longitudinal extent of the depression, walls which steers material flowing through the depressions into the respectively intersecting or overlapping depressions located opposite one another.

Claim 4 (original). High-performance thermal control duct according to Claim 1, wherein the sheet exchange surface is increased by more than 10% in relation to the determined planar sheet surface or layer surface of the flow region of the individual layer by material stripping or material displacement.

Clam 5 (original). High-performance thermal control ducts according to Claim 1, wherein the sheets have a thickness of from greater than 0.5 mm to less than 50 mm.

Claim 6 (original). High-performance thermal control ducts according to Claim 1, wherein the center-to-center distance between two adjacent depressions of a depression row is at least as great as the width of the depression at the surface of the sheet.

Claim 7 **(currently amended)**. High-performance thermal control ducts according to Claim 6, wherein the ratio of depression width to center-to-center distance is from greater than ~~0,7~~ **0.7** to lower than 2.

Claim 8 (original). High-performance thermal control duct according to Claim 1, wherein each depression of one sheet intersects or overlaps with at least 5 depressions of the other or holes of the holed sheet.

Claim 9 (original). High-performance thermal control duct according to Claim 1, wherein said depressions have a depth of from greater than 10% to less than 70% of the sheet thickness.

Claim 10 (original). High-performance thermal control duct according to Claim 9, wherein said depth is from greater than 10% to less than 60% of the sheet thickness.

Claim 11 (original). High-performance thermal control duct according to Claim 1, wherein the geometric longitudinal axis of the depressions are at a preferred angle α of 20 to 70 degrees to the depression row or to the overall flow direction through the duct.

Claim 12 **(currently amended)**. High-performance thermal control duct according to Claim 11, ~~**wherien**~~ **wherein** said angle α is from 40 to 50 degrees.

Claim 13 (original). A method for the thermal control, of gaseous or liquid substances having a viscosity of less than 100 000 mPa·s, which comprises heating or cooling said substances in a heat exchanger having one or more thermal control ducts of Claim 1.

Claim 14 (original). Method for carrying out chemical reactions which comprises carrying out said reactions in a thermal control duct of Claim 1 and even without holed sheet.

Claim 15 (original). A plate-duct heat exchanger or in a cross-current heat exchanger comprising one or more thermal control ducts of Claim 1 and even without holed sheet.

Claim 16 (original). A method for the sterilization of water or of pharmaceutical or biological substances, which comprises sterilizing same in a thermal control duct of Claim 1 and even without holed sheet.

Claim 17 (original). A photo-bioreactor for the breeding of microorganisms, comprising the thermal control duct of Claim 1 and even without holed sheet.

Claim 18 (original). A miniaturized flow duct on a chip for diagnostic purposes, wherein said miniaturized flow duct is a thermal control duct of Claim 1 and even without holed sheet.